

REMARKS

By the present amendment, claims 1-3, 10, 17, 22-23 and 46-62 are pending in the application.

Support For Claims

Amended claims 1 and 17 contain minor amendments in response to rejections under 35 U.S.C. §112, second paragraph, and in the case of claim 1 minor amendments to improve clarity.

Claims 2, 3, 10, 22 and 23 are original or previously presented claims.

Claims 46-62 are new claims containing minor amendments to prior claims in response to rejections under 35 U.S.C. §112, second paragraph, and 35 U.S.C. §101. The correspondence of new claims 46-62 to prior claims is as follows.

<u>New Claims</u>	-	<u>Prior Claims</u>
46 & 47	-	24, 25 & 5
48 & 49	-	6
50	-	27 & 7
51	-	29 & 8
52	-	31 & 9
53 – 54	-	32, 33 & 11
55 – 56	-	12
57 – 58	-	34, 35 & 13

59 - 60	-	36, 37 & 14
61 - 62	-	38, 39 & 15

New matter is not being presented by the present amendment.

Restriction Requirement

The Office Action made the restriction requirement final.

By the present amendment, non-elected claims 16, 18, 19 and 40-45 have been canceled without prejudice to the filing of a divisional application directed to the non-elected claims.

§101

Claims 30 and 31 were rejected under 35 U.S.C. §101.

In response to this rejection, claims 30 and 31 have been canceled and replaced with new claim 52 taking into account the comments of the Office Action.

In view of the present amendment, it is respectfully requested that the rejection under 35 U.S.C. §101 be withdrawn.

§112, ¶2

Claims 1-3, 6, 10, 12, 17 and 22-39 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

In response to this rejection, claims 1 and 17 have been amended by the present amendment taking into account the comments of the Office Action.

There were no specific rejections under 35 U.S.C. §112, second paragraph, of claims 2, 3, 10, 22 and 23.

In response to the rejections under 35 U.S.C. §112, second paragraph, claims 6, 12 and 24-39 have been canceled and replaced with new claims 46-62 taking into account the comments of the Office Action.

In view of the present amendment, it is respectfully requested that the rejections under 35 U.S.C. §112, second paragraph, be withdrawn.

§102

Claims 1-3, 10, 17, 22-25, 28, 29 and 32-39 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,824,568 to Zechman.

This rejection, as applied to the amended and new claims, is respectfully traversed.

Patentability

The present invention relates to a semiconductor device using a bonding material for linking a semiconductor terminal to a connecting terminal for an outside circuit by means of reinforcing the bonding material and/or a joint between the semiconductor terminal and a connecting terminal with a reinforcing material. The present invention provides a high efficiency semiconductor device capable of effectively preventing short circuits of bonding wires. The present invention also provides sufficient strength and fatigue resistance in and around the joints even when the sizes of the bonding materials and terminals are much reduced for satisfying the demands of downsizing of the bonding parts and also provides for higher long-term reliability of bonding joints.

According to the present invention, it is possible to increase the diameter of a bonding wire by coating the wire in a specific portion with a reinforcing material after bonding work, thus increasing the wire strength. This prevents short circuits caused by the contact of a wire with another wire or chip etc., as a result of the bending of the wires occurring during a process such as resin sealing after bonding work. This also prevents damage and breakage of a wire during transportation of a semiconductor device after bonding work.

In addition to the above, the present invention prevents joints from reacting with additives in the resin as well as oxygen and the humidity in the air, and copes with the stress building up at the bonding joints by coating at least the joints with a plating material after they are formed through the bonding of connecting materials onto terminals of the semiconductor device.

Furthermore, the present invention prevents joints from having thermal stress by coating at least the joints with a plating material after they are formed through the bonding of bonding wire onto connecting terminals of the semiconductor device. For this reason, it is made possible to prevent the corrosion and contamination of a diffusion layer and bonding material at a bonding joint and, as a consequence, improve the long-term reliability of the semiconductor device.

On the other hand, the technology disclosed in U.S. Patent No. 5,824,568 provides a technique that allows distortion of the wire during molding while preventing short circuiting and makes it possible to fabricate electronic packages without requiring the high tolerances associates with relatively short length wires drawn tightly. Further US '568 coats the wire with conformable dielectric material, and the problem caused by distortion during molding is eliminated. For these purposes, US '568 is concerned with a composite that comprises an integrated circuit chip having an electrically conductive site thereon, an electrically conductive lead, and electrically conductive wire, including a conformal coating of a dielectric, interconnecting the conductive site and lead. As described above, US '568 only discloses or suggests coating the whole joints including the surface of the chip and terminal with an appropriate dielectric organic coating, and an elimination of distortion of the wire during molding.

However, U.S. Patent No. 5,824,568 does not disclose or suggest the effect of prevention of chemical reaction between the additives, such as Br etc. contained in the resin and the metallic substrate during sealing with sealing resin by means of coating the joints with plating material. As a result, the present invention can increase the strength, Young's modulus and fatigue strength.

As described above, the present invention is different from the technology disclosed or suggested in U.S. Patent No. 5,824,568 in the above mentioned points, even if there are some similarities.

It is therefore submitted that independent claims 1, 3 and 17, and all claims dependent thereon, are patentable over U.S. Patent No. 5,824,568.

CONCLUSION

It is submitted that in view of the present amendment and foregoing remarks, the application is now in condition for allowance. It is therefore respectfully requested that the application, as amended, be allowed and passed for issue.

Respectfully submitted,

KENYON & KENYON

By:



John J. Kelly, Jr.

Reg. No. 29,182

KENYON & KENYON
One Broadway
New York, New York 10004
(212) 425-7200

877996